

REVIEWING RUBBER: ARE WE LOSING OUR GRIPS?

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Abstract

The development of Malaysia's primary commodities sector has had a major impact on the country's economic achievements in the last few decades. The sector continues to feature prominently in the country's economic growth, in terms of its contribution to export earnings and Gross Domestic Product (GDP) as well as in providing employment for the rural populace. In fact, it has played a significant role in helping to cushion the economy from the impact of the previous economic downturn and the present global economic slowdown. Acknowledging the previous role of natural rubber (NR), the paper reviews the changes in the socio-economic scenario of the industry over the period 1996-2006 and cautions against the challenges ahead, particularly with respect to domestic impediments in terms of the uneconomic size of smallholdings, the relatively high incidence of poverty among rubber tappers and smallholders, the dependence of the estate sector on foreign labour as well as external competition from other NR producing countries and the global threat from synthetic rubber.

Introduction

In 1876, Sir Henry Wickham, on request from the India Office, collected and shipped from Brazil 70,000 wild rubber tree seeds. From Brazil, these were rushed to Kew Gardens in London and planted in specially prepared hot-houses. The small number, which survived, was taken to Ceylon in 1877 and later to Malaya (which then renamed as Peninsular Malaysia) and other countries in South-east Asia. The rubber trees quickly flourished in Malaya; large areas of jungle were cut down and planted with rubber trees. Malaysia, particularly Peninsular Malaysia, is currently among the world's most important rubber growing areas.

The rubber industry has played a crucial role in the early post-independence economic development of the country. The fast changing landscape and growth trends within the Malaysian economy were to a considerable extent influenced by the industry.

However, as Malaysia's economic focus shifted from primary industries to broad-based export-oriented manufacturing activities, the structural transformation has impacted greatly upon the agricultural sector in general and the rubber industry in particular. From being the premier producer of NR in the 1970s and 1980s, Malaysia has gradually lost its position to neighbouring competitors, namely Thailand and Indonesia. Production has since been on a downward trend.

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Nevertheless, rubber production remains an important component in the national economy. As a consequence of the industrialisation process, production has assumed a new and important role - supplying raw materials for the production of both rubber and rubber wood products.

Statistically, the total planted rubber area for the last 17 years fell by 33.2 per cent from 1.84 million hectares in 1990 to 1.23 million hectares in 2006. The decline was most significant in the estate sector, which experienced a reduction of 84.5 per cent from 348,750 hectares to 54,153 hectares. In tandem with the decline in planted areas, rubber production also contracted by 2.3 per cent from 1.29 million tonnes in 1990 to 1.26 million tonnes in 2006. However, the export value of NR from Malaysia increased 265 per cent from RM3.03 billion in 1990 to RM8.03 billion in 2006.

Malaysia's NR production accounted for almost 14 per cent of the world's NR in 2006, against the more significant output of 28.7 per cent and 34.1 per cent by Indonesia and Thailand respectively. The bulk of Malaysia's rubber comes from thousands of privately owned plots of land called smallholdings, which are usually about 2 hectares. The rest is grown on big estates owned by various companies, each covering over a thousand hectares.

The NR industry performed remarkably well during the 2001–2005 period despite facing immense challenges both globally and domestically. The rubber market strengthened in 2002, signalling a reversal of the downward trend in prices and performance of the rubber industry since 1998. Export earnings which amounted to RM12.9 billion in 2002, an increase of 9.1 per cent from 2001, surged to RM15.0 billion in 2003. In 2004, the total export earnings again increased by 30.1 per cent to reach RM19.5 billion. The industry's contribution further improved to reach RM24.2 billion in 2006, representing an increase of RM3.2 billion or 15.2 per cent from 2005.

The Third Industrial Master Plan (IMP3) acknowledges the significant role of rubber, together with oil palm, cocoa, timber, tobacco and minerals, in complementing and supporting the overall industrial development of the country. Similarly, besides oil palm, cocoa and timber, the Third National Agriculture Policy (NAP3) (1998-2010) also identifies rubber as one of the major contributors to agriculture value-added activities.

The following sections will proceed to review the global outlook pertaining to production and consumption of both natural and synthetic rubber, followed by a profile of the rubber industry in Malaysia with respect to its contribution to the Gross Domestic Product (GDP) and the country's international trade. Against this background, the paper then highlights the structural issues with respect to uneconomic size of smallholdings and socioeconomic impediments facing the industry in terms of labour supply and incidence of poverty among the smallholders.

Global Outlook

a. World natural rubber production and consumption

In the global scenario, the production of NR rose by 32.5 per cent to 8.79 million tonnes in 2005 as compared to the 2000 production of 6.6 million tonnes. Asia accounted for 99.7 per cent of total world production in 2005, with Thailand, the world's largest producer had accounted for 33.4 per cent. Production in Thailand has increased with an output of 2.9 million tonnes recorded in 2005, representing a 2.3 million tonnes increase from 2000. Indonesia, the second largest producer, has increased its output from 1.5 to 2.3 million tonnes in the period 2000-2005. Malaysia was the world's largest producer once, but started to lose its spot in the 90s. However, the downward trend in Malaysian production over the last decade showed some reversed commencing 2002 with output rose from 889,830 tonnes to 1.1 million tonnes in 2005. In spite of that, Malaysia still maintains its position as the third largest NR producer in the world (Table 1). Meanwhile, with relatively low labour cost and apparently minimal government support, production in India, China and Vietnam are on a steady growth path.

Table 1: World major producing countries of natural rubber

Country	Production ('000 tonnes)									% of 2005 Total
	1990	1991	1995	2000	2001	2002	2003	2004	2005	
Thailand	1,271.0	1,341.2	1,804.8	2,346.4	2,319.6	2,615.1	2,876.0	2,984.3	2,937.2	33.4
Indonesia	1,262.0	1,284.0	1,454.5	1,501.1	1,607.3	1,630.0	1,792.0	2,066.2	2,271.0	25.8
Malaysia	1,291.0	1,255.7	1,089.3	927.6	882.1	889.7	985.6	1,168.7	1,126.0	12.8
India	323.5	360.2	499.6	629.0	631.5	640.3	707.1	742.6	771.5	8.8
China P.R.	264.2	269.0	424.0	445.0	464.0	468.0	480.0	486.0	428.0	4.9
Vietnam	102.0	64.5	155.0	290.8	312.6	331.4	363.5	402.7	509.0	5.8
Africa	319.3	318.0	279.3	361.7	377.0	369.0	364.8	379.4	597.1	6.8
Sri Lanka	113.1	104.5	105.7	87.6	86.2	90.5	92.1	94.1	104.4	1.2
Cambodia	32.0	30.5	38.0	42.2	46.5	43.0	45.0	43.0	44.5	0.5

Source: Statistics on Commodities 2006, Ministry of Plantation Industries and Commodities

Global consumption of NR rose from 5.3 million tonnes in 1990 to 7.9 million tonnes in 2003. Higher demand for motor vehicles, and hence for tyres, and the hike in oil prices which resulted in higher prices for synthetic rubber, contributed to the stronger demand for NR. With its fast expanding economy and sharp increase in demand for cars, China had emerged as the world's largest NR consuming country, surpassing the United States of America (USA). Consumption in China had increased by 86.5 per cent from 780,000 tonnes in 1995 to 1.46 million tonnes in 2003. USA and Japan continued to be the other major consumers of NR. Consumption in these countries in 2003 were 1.08 and 0.78 million tonnes respectively.

b. World synthetic rubber production and consumption

Global production of synthetic rubber rose to 12.1 million tonnes in 2005 as compared to the 2000 level of 10.8 million tonnes (Table 2). Production in USA, Japan and China accounted for 50 per cent of world production in 2003. Meanwhile, global consumption of synthetic rubber rose by 11.1 per cent to 12.0 million tonnes in 2005 from 10.8 million tonnes in 2000. China is the world's largest consuming country of synthetic rubber, with a consumption level of 2.1 million tonnes in 2003. USA, Japan and Germany continued to be the other major consumers of synthetic rubber.

Table 2: World synthetic rubber production and consumption

Year	Production ('000 tonnes)	Consumption ('000 tonnes)
2000	10,818	10,759
2001	14,483	10,247
2002	10,882	10,717
2003	11,390	11,397
2004	11,989	11,850
2005	12,053	11,955

Source: Statistics on Commodities 2006, Ministry of Plantation Industries and Commodities

c. World natural rubber exports

The three major NR producing countries (Thailand, Indonesia and Malaysia) accounted for more than 82 per cent of the world's net exports. During the period 2000-2006, Thailand's net exports expanded by 16.3 per cent from 2.2 million tonnes to 2.5 million tonnes. Indonesia recorded a greater increase of 59.7 per cent, from 1.4 million tonnes in 2000 to 2.2 million tonnes in 2006. Meanwhile, during the same period, net exports from Malaysia increased by 52.6 per cent from 0.43 to 0.66 million tonnes. Vietnam, the emerging NR producing country, has increased its net exports of NR by 102.0 per cent from 254,000 tonnes in 2000 to 513,000 tonnes in 2006 (Table 3).

Table 3: Net exports of natural rubber by major producing countries

Country	Net Exports ('000 tonnes)							% of 2006 Total
	2000	2001	2002	2003	2004	2005	2006 ^e	
Thailand	2,166.2	2,042.1	2,573.0	2,573.4	2,637.1	2,632.7	2,519.1	38.9
Indonesia	1,379.6	1,496.9	1,502.2	1,660.5	1,875.1	2,023.9	2,202.6	34.0
Malaysia	429.7	345.1	430.0	509.7	679.9	666.0	655.8	10.1
Vietnam	254.0	283.0	325.0	325.0	340.0	445.0	513.0	7.9
Sri Lanka	32.6	32.0	36.1	35.4	40.3	31.6	33.9	0.5
Cambodia	39.0	38.0	40.0	41.0	40.5	41.0	43.5	0.7
Others	622.9	832.9	518.3	455.4	520.1	407.8	510.6	7.9
TOTAL	4,924.0	5,070.0	5,424.6	5,600.4	6,133.0	6,248.0	6,478.5	100.00

e = estimated

Source: Statistics on Commodities 2006, Ministry of Plantation Industries and Commodities

d. Natural rubber prices

Table 4 presents prices for Ribbed Smoked Sheets (RSS) and Standard Malaysian Rubber (SMR) from 1996 to 2005. Prices of NR started to ease in 1996 after reaching its peak in 1995 in the 90s. There were short recoveries in 1998 and 2000, but generally prices were on the downward trend. Prices however, bounced back strongly beginning 2002 and in 2003 the RSS1 broke the 400.00 sen mark. The buoyant rubber prices continued and peaked at 894.50 sen/kg on 4th July 2006. Thereafter, prices started to decline with an improvement in production by major NR producing countries. The average 2005 prices for SMR CV and SMR 20 at 627.30 sen/kg and 523.07 sen/kg respectively were higher than in the corresponding period of 2004 by 12.8 per cent and 13.2 per cent respectively.

**Table 4: Average prices for RSS1, SMR CV and SMR 20
1996 – 2005 (Malaysian sen/kg)**

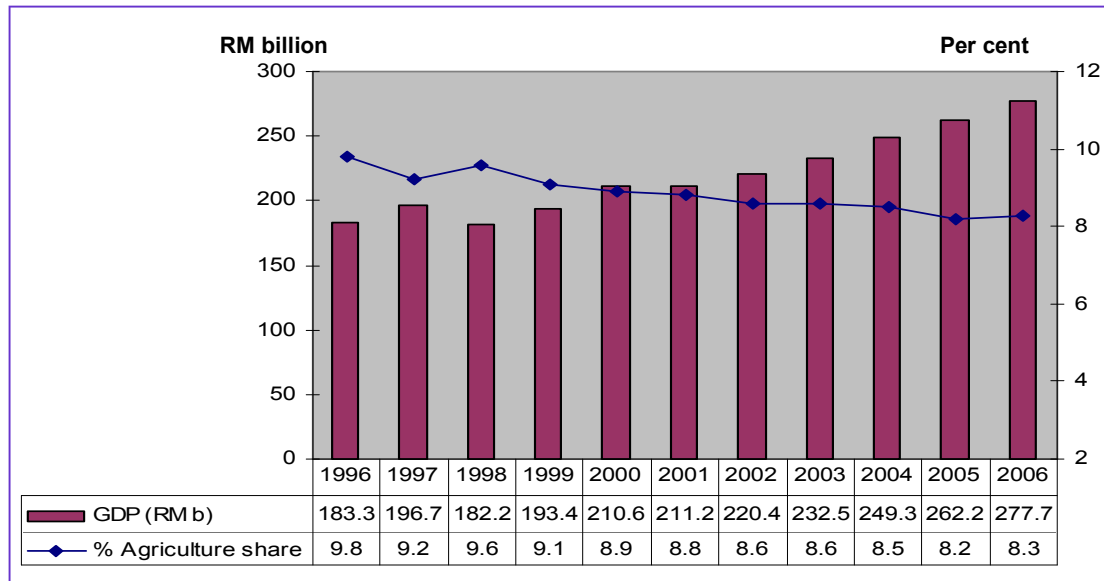
Year	RSS1	SMR CV	SMR 20
1996	350.40	399.50	329.55
1997	278.10	325.40	271.83
1998	280.50	359.87	257.00
1999	239.30	274.98	226.94
2000	261.90	303.00	242.52
2001	227.30	269.20	205.56
2002	293.30	347.10	285.90
2003	400.64	472.89	378.97
2004	-	556.03	461.93
2005	-	627.30	523.07

Source: <http://www.lgm.gov.my>**Rubber industry in Malaysia****a. Contribution of agriculture to GDP**

The Malaysian economy is highly trade-oriented, having initially relied on the agriculture and mining sectors. Although the agriculture sector constituted about 40 per cent of our GDP in the late 1950s, the economy became gradually more diversified, arising from the implementation of various industrial and development policies in the 1960s and 1970s, with greater focus on export diversification. In the early 1980s, the government implemented several measures to develop selected heavy industries in order to broaden the industrial base and to develop indigenous capabilities in the manufacturing sector.

The share of the agriculture sector to GDP has over the years shown a steady decline (Figure 1). In 1996, the share was 9.8 per cent and in 2005, 8.2 per cent. However, the robust global growth in 2006 resulted in an upsurge in the demand for electronics as well as the primary commodities¹. On the supply side, this was reflected in the share of the sector to overall GDP (8.3 per cent). The agriculture sector also registered a strong performance of 6.4 per cent, the highest growth rate since 1992. Growth expansion was realised in rubber, oil palm and cocoa output, while food related activities pertaining to fisheries, livestock, paddy, fruits and vegetables recovered from the adverse weather conditions. Growth was mainly supported by increase in yields, amidst the high commodity prices and favourable weather conditions.

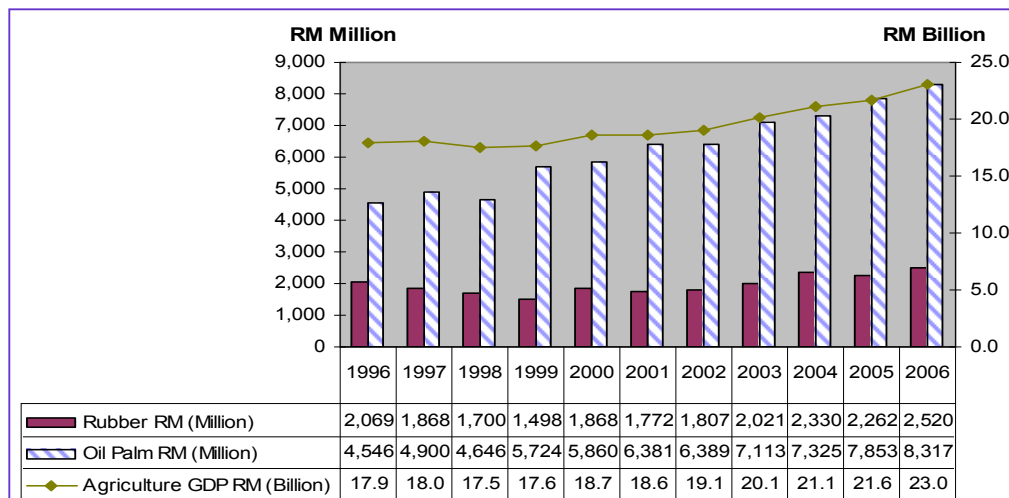
Figure 1: Malaysia's GDP – growth, trend and percentage share of agriculture 1996 – 2006 (in 1987 real prices)



Source: National Product and Expenditure Accounts, Fourth Quarter 2006,
Department of Statistics, Malaysia

The agriculture value-added portion of our GDP slumped from 28.4 per cent in 1970 to 8.3 per cent in 2006. Oil palm increased its share to account for 36.1 per cent of agriculture value-added in 2006 (1996: 24.8 per cent), while rubber declined from 11.6 per cent in 1996 to 11.0 per cent in 2006. The annual value added of rubber contracted by 5.6 per cent in 1990-2006. In contrast, oil palm expanded steadily at an average rate of 5.2 per cent.

Figure 2: GDP growth and percentage change for rubber and oil palm 1996 – 2006 (in 1987 real prices)



Source: National Product and Expenditure Accounts, Fourth Quarter 2006,
Department of Statistics, Malaysia

In contrast to the overall 5.7 per cent real GDP growth, the agriculture sector expanded marginally by 0.8 per cent during 1990-2006, with the pace of development largely driven by the buoyant oil palm sub-sector. Despite some achievements, the share of agricultural output has remained small, reflecting the more rapid expansion of other sectors. With the many challenges that rubber plantations have had to face, the industry has delivered a dismal performance during the period under review. Overall, the share of the rubber industry (upstream and downstream) value added to GDP declined from 3.9 per cent in 1990 to 1.5 per cent in 2003. This was mainly attributed to lower rubber production in line with the persistent decline in planted areas. Rubber estates have been largely converted to other plantations and housing areas. Furthermore, labour shortage and depressed prices have also led to the increasing neglect or abandonment of rubber estates.

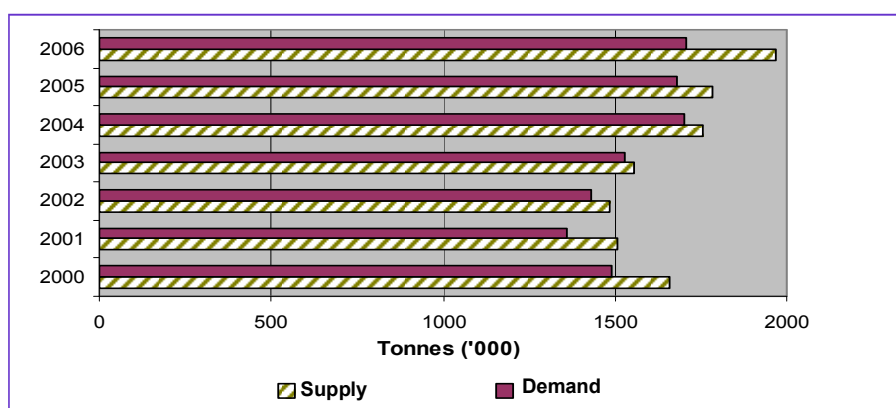
Similar to the other sectors, a key development thrust for the agriculture sector during the Third Outline Perspective Plan (OPP3) for the 2001-2010 period is to promote wealth and new sources of growth. Therefore, we expect greater restructuring and modernisation in the agriculture sector, to ensure its dynamism and competitiveness. As outlined in the NAP3, the development of industrial crops will continue to be encouraged and supported by appropriate incentives, infrastructure, research and development, support services and human resource development.

The government, together with the private sector, have shown a serious commitment in their efforts to revitalise the agriculture sector, the outcome of which is expected to help sustain its position as the third largest economic sector in the country.

However, despite increased efforts and policy adjustments to promote the cultivation of rubber, the appropriate response does not appear to be forthcoming. In this respect, it seems that there are imbalances in the development of industrial crops, favouring the oil palm sector.

b. Supply and demand

The annual supply of NR from 2000-2006 ranged from 1.65 million tonnes to 1.96 million tonnes as shown in Figure 3. On the other hand, the demand for NR has increased over the last seven years, increasing from 1.49 million tonnes in 2000 to 1.70 million tonnes in 2006. This indicates that the supply of NR Malaysia is higher than the demand.

Figure 3: Natural Rubber - Supply and Demand

Source: Monthly Rubber Statistics (January – December 2006),
Department of Statistics, Malaysia

c. Import and export

Between 2000 and 2006, the annual import volume of NR decreased by 33.3 per cent from 781,774 tonnes to 520,685 tonnes. In comparison, the export volume increased by 16.5 per cent from 0.97 million tonnes to 1.13 million tonnes. In value terms, imports registered a growth of 72.3 per cent from RM1,192.1 million to RM2,053.8 million. Export value increased by 44.8 per cent from RM5,685.6 million to RM8,234.6 million as shown in Table 5. The balance of trade over the years has shown an upward trend from 196,201 tonnes to 613,671 tonnes. In terms of value, the balance of trade increased 37.5 per cent from RM4,493.5 to RM6,180.8.

Table 5: Natural rubber balance of trade, 2000 – 2006

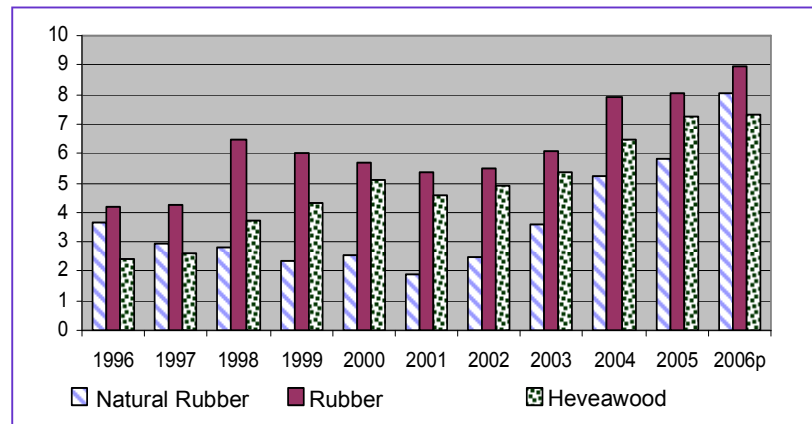
Year	Imports		Exports		Balance of Trade	
	Volume ('000 tonnes)	Value (RM million)	Volume ('000 tonnes)	Value (RM million)	Volume ('000 tonnes)	Value (RM million)
2000	781.8	1,192.1	978.0	5,685.6	196.2	4,493.5
2001	659.1	1,239.1	820.9	5,349.1	161.8	4,110.0
2002	456.9	1,470.2	887.0	5,525.2	430.1	4,055.0
2003	436.6	1,481.9	946.5	6,064.6	509.9	4,582.7
2004	426.2	2,083.2	1,106.1	7,876.6	679.9	5,793.4
2005	477.8	1,602.5	1,127.9	5,786.5	650.1	4,184.0
2006p	520.7	2,053.8	1,134.3	8,234.6	613.6	6,180.8

p = Provisional

Source: Unpublished data from Department of Statistics, Malaysia

The export of NR and rubber-based products increased by 116.7 per cent from RM7.8 billion in 1996 to register at RM16.9 billion in 2005. Total export earnings of the rubber industry, including heveawood products, rose to RM24.3 billion in 2006 from RM10.3 billion in 1996, accounting for 4.2 per cent of national exports earnings in 2006, as shown in Figure 4.

Figure 4: Rubber industry's contribution to national exports (RM billion)

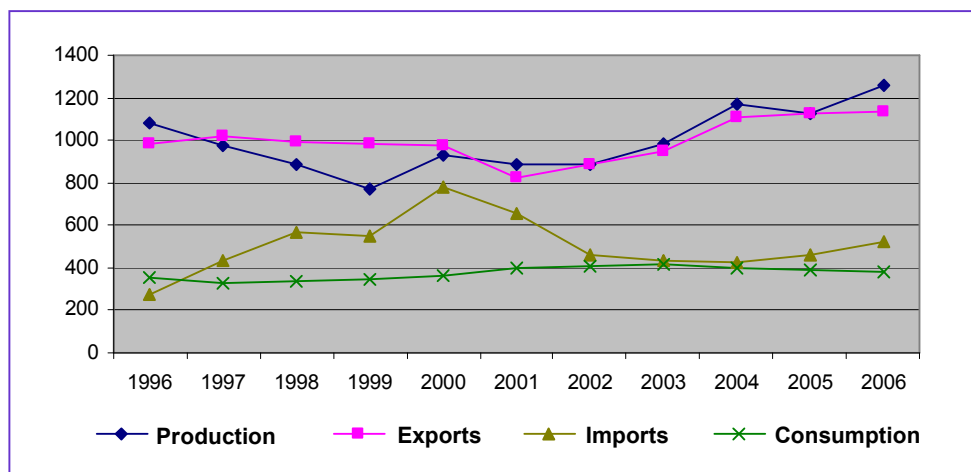


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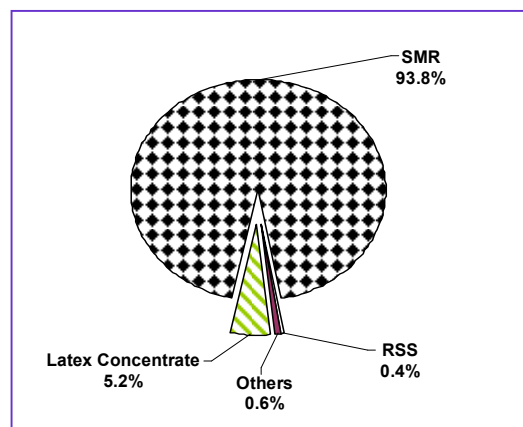
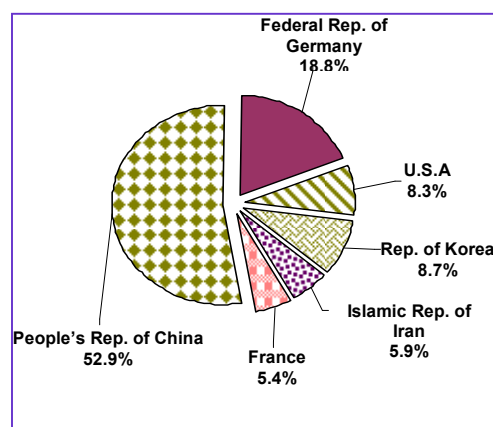
Source: <http://www.lgm.gov.my>

Figure 5 shows that the exports of NR increased by 11 per cent to 1,259,631 tonnes in 2006 from 1,126,002 tonnes in 2005. The major type of rubber exported was SMR, which accounted for 93.8 per cent of total exports. The other types of rubber exported were latex concentrate, RSS and other rubber (Chart 1). The major export destinations for NR in 2006 were the People's Republic of China (405,532 tonnes), the Federal Republic of Germany (144,156 tonnes) and U.S.A (63,801 tonnes), which collectively constituted 54.1 per cent of Malaysia's NR exports. The other major exports destinations were the Republic of Korea, the Islamic Republic of Iran and France (Chart 2).

Figure 5: Natural rubber trends ('000 tonnes)



Source : <http://www.lgm.gov.my>

Chart 1: Exports of natural rubber by type**Chart 2: Exports of natural rubber by major countries**

Source: Monthly Rubber Statistics (January - December 2006), Department of Statistics, Malaysia

The Malaysian rubber-based industry produces a wide range of products covering all the five main sectors defined as tyres and tubes, latex-based products, footwear, industrial rubber goods (IRG) and general rubber goods (GRG), as shown in Table 6. The Malaysian rubber-based industry continued to grow during the period 2002-2005 after a decline in 1999-2001. Malaysia has excelled in latex-based products and maintained its position as the major supplier of gloves, latex thread and catheters. Malaysia is also known as the world's leader in medical gloves. Due to this, the Standard Malaysian Glove (SMG) program, which is a joint effort by the Rubber Research Institute of Malaysia (RRIM), Malaysian Rubber Board (MRB) and Malaysia Glove Manufacturers, was introduced by the Malaysian Rubber Export Promotion Council (MREPC). The SMG program establishes standards not only for barrier protection, but also includes the permissible level for protein and powder content, elements which are believed to cause allergic reactions in individuals sensitive to latex proteins.

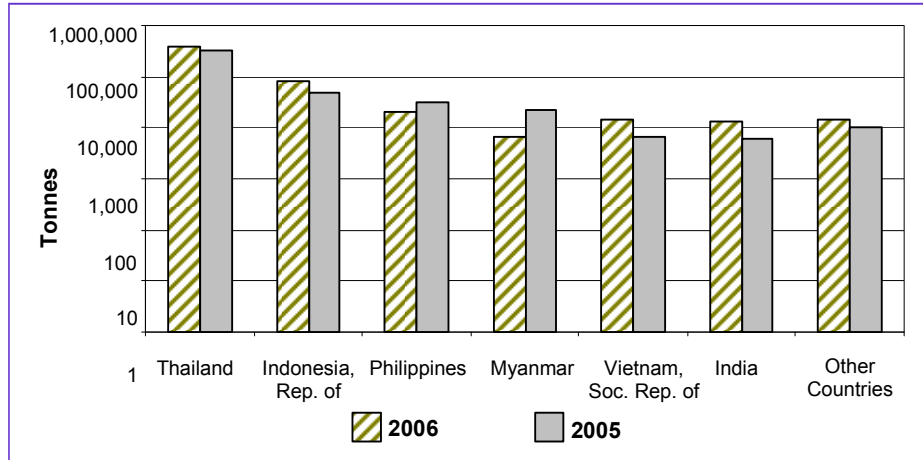
Table 6: Malaysia's exports of rubber products by product group (RM million)

Year	Tyre	Inner Tubes	Footwear	Latex Products	IRG	GRG	Industry Total	
							Value	% of National
1996	191.84	16.14	188.13	3,393.67	61.31	336.92	4,188.02	2.1
1997	164.43	10.54	198.79	3,697.26	113.75	426.80	4,611.58	2.1
1998	321.63	15.82	211.79	5,260.10	198.37	483.43	6,491.12	2.3
1999	292.64	15.31	275.05	4,737.98	196.95	508.59	6,026.53	2.4
2000	243.89	13.56	301.97	4,498.84	130.05	497.23	5,685.55	1.5
2001	245.02	15.86	222.38	4,246.75	133.96	485.11	5,349.08	1.6
2002	418.20	34.00	209.84	4,335.46	62.01	465.67	5,525.17	1.6
2003	301.73	15.15	262.05	4,809.04	150.99	525.60	6,064.56	1.6
2004	413.65	18.10	857.42	5,818.37	188.88	580.19	7,876.62	1.6
2005	457.72	26.47	459.66	6,159.67	253.01	674.47	8,031.00	1.5

Source: <http://www.lgm.gov.my>

NR imports increased by 13 per cent to 521,669 tonnes in 2006 from 461,857 tonnes in 2005. Figure 6 shows the imports of NR from major countries in 2005 and 2006. Thailand remained the major supplier of NR, accounting 71.6 per cent of Malaysia's total imports, followed by Republic of Indonesia 15.2 per cent, Philippines 4.0 per cent, Socialist Republic of Vietnam 2.7 per cent and India 2.5 per cent. These five countries accounted for 96 per cent of the overall NR imports.

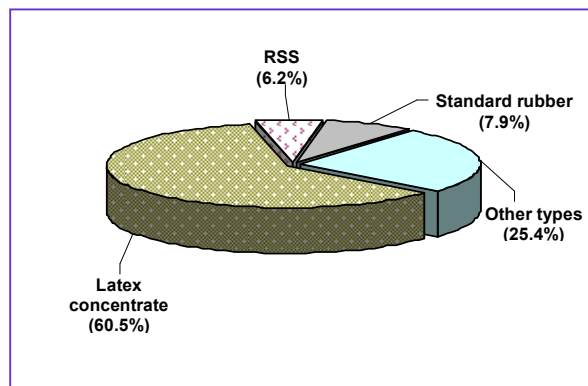
Figure 6: Imports of natural rubber from major countries, 2006/2005



Source: Monthly Rubber Statistics (January – December 2006), Department of Statistics, Malaysia

In terms of imported types of NR, the main type is latex concentrate which accounted for 60.5 per cent of total imports in 2006 as illustrated in Chart 3. The other types include RSS and standard rubber.

Chart 3: Imports of natural rubber by type, 2006



Source: Monthly Rubber Statistics (January – December 2006), Department of Statistics, Malaysia

d. Domestic consumption

The consumption of NR has grown significantly, indicating an expanding downstream sector. Domestic consumption recorded an increase of 106.1 per cent in 2006, from 183,549 tonnes in 1990 to 378,345 tonnes in 2006. The increase is particularly significant in the latex products manufacturing industries, which accounted for 80.5 per cent of total domestic consumption of NR in 2006. Similarly, consumption of synthetic rubber has also increased from 55,605 tonnes in 2000 to 112,400 tonnes in 2006. Notwithstanding this, the ratio of natural to synthetic rubber consumption as at end of 2003 was 95:28, reflecting the demand for NR especially by the latex products manufacturing industries.

Over the years, the percentage of domestic consumption over production has shown a positive trend, increasing from 14.2 per cent in 1990 to 42.7 per cent in 2003 as shown in Table 7. This positive trend is in line with the objectives of NAP3 which encourage value added activities of local production. Similarly, consumption over total supply (production and imports) also showed an upward trend from 12.9 per cent in 1990 to 27 per cent in 2003.

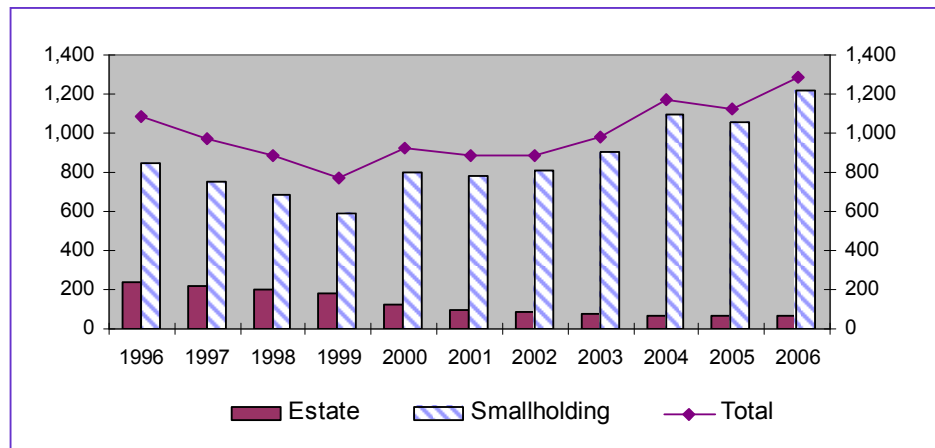
Table 7: Supply – consumption linkage

Year	Production (‘000 tonnes)	Import (‘000 tonnes)	Total Supply (‘000 tonnes)	Consumption (‘000 tonnes)	Per cent of Consumption over Production	Per cent of Consumption over Total Supply
1990	1,291.0	136.2	1,427.2	183.5	14.2	12.9
1995	1,087.5	235.8	1,323.3	327.4	30.1	24.7
2002	889.8	456.9	1,485.0	407.9	45.8	27.5
2003	985.6	436.6	1,557.8	420.8	42.7	27.0
2004	1,168.7	426.2	1,757.5	402.8	34.5	22.9
2005	1,126.0	461.9	1,782.9	386.5	34.3	21.7
2006	1,283.6	521.7	1,945.3	378.3	29.5	19.4

Source: <http://www.lgm.gov.my>

e. Domestic production

Production of NR increased from 1.08 million tonnes in 1996 to 1.28 million tonnes in 2006. Production from the estate sector accounted for only 5.3 per cent (68,398 tonnes) of total production in 2006 while production from the smallholders was 1.22 million tonnes. The production by this sector for the period 1996-2006 increased by 370,875 tonnes. Production by smallholders started to pick up in 2002 and 2003, which was 804,953 and 909,286 tonnes respectively, in tandem with the increase in rubber prices. To some extent, the increase may be attributed to government assistance programs for smallholders (principally the Rubber Smallholder’s Income Supplement Scheme and Assistance for Low Intensity Tapping Systems Adoption) implemented in mid-2001, which encouraged tapping and increased tree and land productivity.

Figure 7: Natural rubber production ('000 tonnes)

Source: Quarterly Natural Rubber Statistical Bulletin – Vol. 32,
Association of Natural Rubber Producing Countries (ANRPC)

Considering that production from the estate sector will continue to decline, future supply of raw materials for the expanding rubber products downstream industries will be dependent upon the smallholder sector. In order to sustain and further develop the smallholder sector as the primary supplier of raw materials for the rubber products downstream industries, concerted efforts and development programs are needed, particularly to address the various issues and constraints inherent in the smallholder sector such as lack of capital, ageing population, labour shortage, uneconomic holdings and low productivity.

To better comprehend the importance of the rubber industry, the Input-Output (IO) tables are used to gauge its contribution to the various economic activities in Malaysia. Based on the IO tables of 1987, 1991 and 2000, the order of magnitude and change over time provide some indication of the importance of the rubber industry to the overall needs of each rubber-related activities.

Table 8: Contribution to gross output

Rubber-related activities	1987 Gross Output (RM million)	% of total	1991 Gross Output (RM million)	% of total	2000 Gross Output (RM million)	% of total
Rubber Planting	3,502.2	2.3	2,994.2	1.0	2,036.4	0.2
Rubber Processing	3,452.5	2.3	2,939.8	1.0	3,255.4	0.4
Rubber Industries	1,173.5	0.8	3,231.6	1.1	7,351.9	0.8
Sub total	8,128.2	5.4	9,165.6	3.1	12,643.7	1.4
TOTAL OUTPUT	150,123.5	100.0	304,428.7	100.0	896,827.8	100.0

Source: Computations based on IO tables published by DOSM

Notes : Rubber planting output comprises of field latex, unsmoked sheets, wet slabs, scrap, lump and bark, rubber seed and planting materials, logs and rubber trees.

Rubber processing output comprises of processed latex, sheet rubber such as A.D.S and R.S.S, crepe rubber, block rubber such as S.M.R and other rubber.

Rubber industries output comprises of tyres and tubes, rubber footwear and other rubber products, n.e.c.

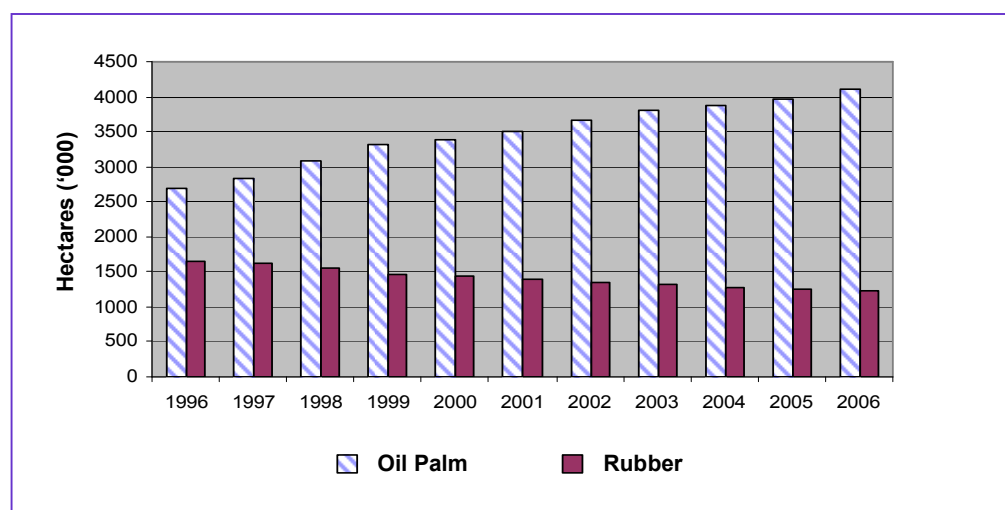
The relative contribution of the rubber-related activities to gross output is still insignificant, ranging from 5.4 per cent in 1987 to 3.0 per cent in 1991 to 1.4 per cent in 2000. Within the rubber sector, it can be perceived that the rubber industries sub-sector is still important in terms of production value, contributing more than 58 per cent of total rubber output and showing potential for further expansion. At the same time, rubber processing activities appear to be the next most important industry, with a contribution of 25.8 per cent of the total rubber output.

Structural issues and socioeconomic impediments

a. Planted area and rubber replanting

Smallholdings account for 95.6 per cent of the estimated planted area under rubber of which 20 per cent are “organised” smallholdings which come under the purview of government agencies. The balance of 4.4 per cent is taken up by estates. In terms of production, 94.7 per cent of total production is accounted for by smallholdings while estates take up the remaining 5.3 per cent. The estimated planted area under rubber is 1.225 million hectares in 2006, which is a decline of 15.270 million hectares compared to 1996 and 0.025 million hectares compared to 2005 (Figure 8). The decline is due to abandoned holdings as well as conversion of some rubber plantations to other activities.

Figure 8: Total area planted by crops (in hectares)



Source: Statistics on Commodities 2006, Ministry of Plantation Industries and Commodities

To ensure an adequate supply of rubber and rubber wood for downstream activities, the rubber replanting programme ensured that at least 20,000 hectares was replanted annually with latex timber clones, especially in designated rubber zones. In the 8th Malaysia Plan, the rubber replanting target was 40,000 hectares per year of which 20,000 hectares was for the replanting of rubber with rubber.

The trend of replanting rubber areas with oil palm has been decreasing, particularly from 2001 to 2006 (Table 9). During this period, a total of 164,150 hectares of rubber replanting took place. Of this, 105,511 hectares or 64.3 per cent were replanted with rubber, 57,800 hectares or 35.2 per cent were converted to oil palm and 0.5 per cent (839 hectares) replanted with other crops.

In contrast, the total oil palm planted areas had increased especially in Sabah and Sarawak due to expansion into areas not previously planted with rubber or oil palm. The total planted hectareage is expected to increase by 3.5 per cent to 4.1 million hectares.

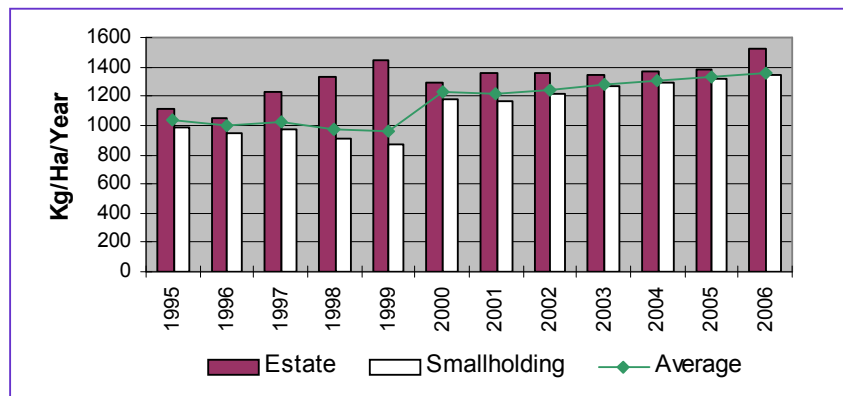
Table 9: Area replanted from rubber to rubber, oil palm and other crops (hectare) 2000 - 2006

Year	Rubber	%	Oil Palm	%	Other Crops	%	Total
1995	22,887	62.1	9,611	26.1	4,353	11.8	36,851
1996	21,650	62.4	10,795	31.1	2,279	6.6	34,724
1997	11,343	46.8	12,061	49.7	844	3.5	24,248
1998	9,125	46.0	10,227	51.5	508	2.6	19,860
1999	1,994	14.6	11,563	84.8	83	0.6	13,640
2000	5,222	12.3	36,369	85.7	828	2.0	42,419
2001	7,233	23.2	23,335	74.8	637	2.0	31,205
2002	19,029	70.9	7,693	28.7	106	0.4	26,828
2003	19,043	90.8	1,879	9.0	50	0.2	20,972
2004	19,408	93.7	1,257	6.1	46	0.2	20,711
2005	20,586	86.3	3,269	13.7	-	-	23,855
2006	20,212	49.8	20,367	50.2	-	-	40,579

Source: Unpublished data from Rubber Industry Smallholders Development Authority (RISDA)

b. Yield

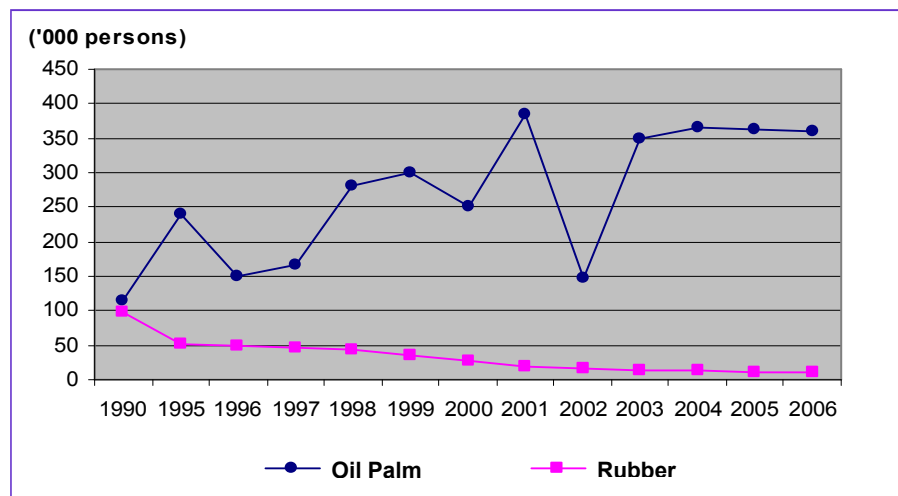
The national average yield of NR is about 1,220 kg per hectare per year. Generally the average yield of the estate sector is higher than the smallholder sector. In 2005, the yield of the estate sector was 1,519 kg/ha as compared to 1,350 kg/ha in the smallholder sector. The lower yield of the smallholder sector can be attributed to various reasons such as lower use of technology and neglected farm management practices, presence of low yielding clones and under-exploitation of holdings. The lower productivity of the smallholder sector compared to the estate sector suggests that there is potential for further improvement in the yield of the smallholder sector through better holding management, replanting with high yielding clones and adoption of better technology.

Figure 9: Natural rubber yield (kg/ha/yr)

Source: <http://www.lgm.gov.my>

c. Employment

The number of persons employed in the rubber estates continued to decline in tandem with waning interest of plantation companies in rubber cultivation. The number of employees decreased 2.0 per cent in 2006 to 11,746 persons from 11,991 persons in 2005 (Figure 10). The reduction of employment in rubber plantations is accompanied by an increasing trend of employment in the oil palm sector. This rapid increase in employment in oil palm plantations is mainly due to the increasing trend of change-over from rubber to oil palm over the years for higher profitability.

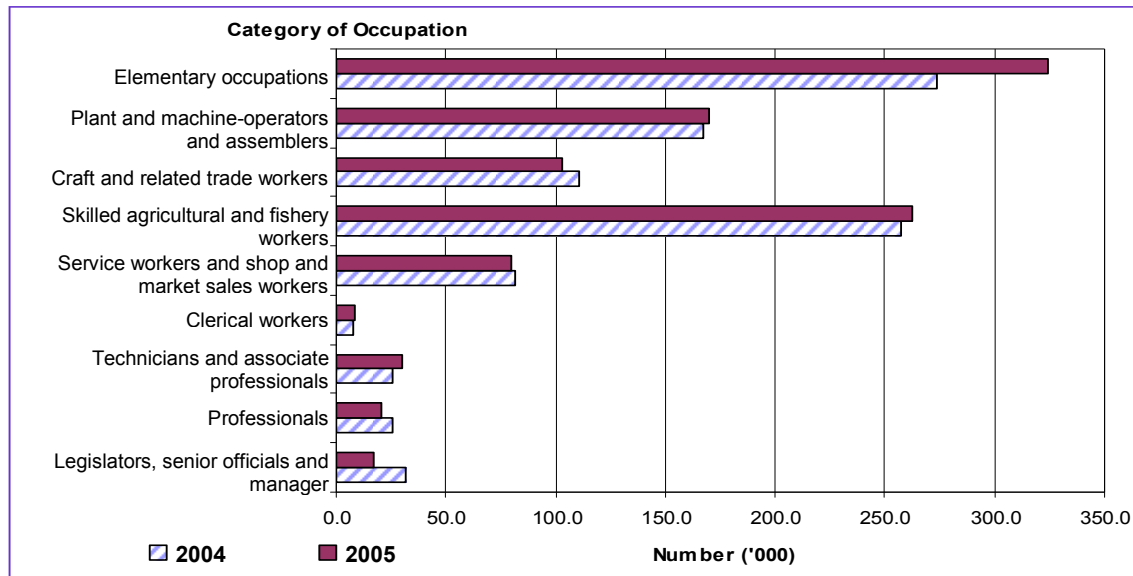
Figure 10: Employment in rubber and oil palm plantations

Source: Statistics on Commodities 2006, Ministry of Plantation Industries and Commodities

In terms of non-citizens employed, the number increased substantially over the years i.e. from 257.3 thousand persons (26.2 per cent) in 2004 to 262.6 thousand persons (25.9 per cent) in 2005² (Figure 11). Their participation was mainly in the elementary occupations and skilled agricultural and fishery workers. Among the reasons local

job-seekers are less attracted towards the agriculture sector are the negative perception towards the sector, particularly its association with the 3D factors of dangerous, dirty and difficult; the slow implementation of mechanisation to improve the sector because of geographical factors and the high costs involved; low salaries and wages and the apparent mismatch between available employment opportunities and the higher level of education attained by the youngsters³.

Figure 11: Number of non-citizens employed by category of occupation, 2004-2005



Source: Labour Force Survey (Profile of Non-Citizens), Department of Statistics, Malaysia

d. Profile of smallholders

The fact that several data sets on smallholders are currently available is not only a reflection of the different needs of the respective stakeholders at different points of time, but also poses a challenge in obtaining a consistent profile of the smallholders over a longer time interval. Since each data set has its own strengths and limitations, and is often based on a set of concepts and definitions that differs from that of other data sources, we will attempt to employ two relatively recent data sets, from DOSM's Agriculture Census 2005 and the Census on Rubber and Oil Palm Smallholders carried out by the Rubber Industry Smallholders Development Authority in 2002⁴ (RISDA Census 2002). In the RISDA Census 2002, the total number of rubber smallholders in Peninsular Malaysia in 2002 was estimated at 235,160 whereas the total size of the smallholdings was 607,008 hectares. From the number of respondents, a total of 180,149 smallholders were surveyed of which 127,993 were rubber smallholders with 294,748 hectares while 52,156 were oil palm smallholders with 145,196 hectares. The coverage of this Census was focused on rubber and oil palm smallholders in Peninsular Malaysia, where the smallholder was defined as an individual who owned/cultivated legally based on National Land Code 1965 with a total cultivated area less than 40.47 hectares. The survey was conducted from 15th January 2002 to 15th February 2002.

Table 10: Differences between Agriculture Census 2005 and RISDA Census 2002

	Agriculture Census 2005	RISDA Census 2002
Number of operators	84,900	127,993
Cultivated area (hectares)	146,252	294,748

Source: DOSM: Agriculture Census 2005 - Crops

RISDA: Census of Rubber and Oil Palm Smallholders 2002

In 2005, the Department of Statistics conducted the Agriculture Census. The Census defined a rubber operator as anyone aged 15 years and above who was involved in rubber planting as the main occupation. Excluded are part-time rubber operators and establishments such as the Federal Land Development Authority (FELDA), Federal Land Consolidation and Rehabilitation Authority (FELCRA), Rubber Industry Smallholders Development Authority (RISDA), land schemes and estates.

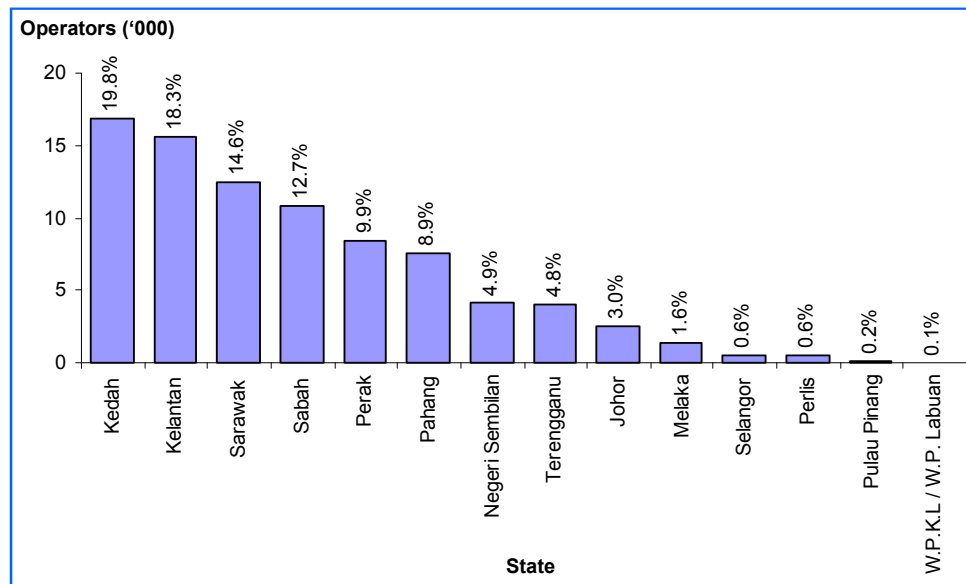
In terms of ethnicity, the RISDA Census 2002 showed that smallholders comprised 77.7 per cent Malays, 20.0 per cent Chinese, 1.0 per cent Indians, 0.4 per cent Orang Asli and 0.9 per cent Others. Malay smallholders were mainly concentrated in Terengganu, Kelantan and Kedah, accounting 92.5 per cent of their respective smallholder population. Johor, which has the highest number of Malay smallholders in the country, only accounted for 16.6 per cent from the total smallholders. Chinese smallholders were mainly found in Penang, Johor, Perak and Pahang accounting for 76.8 per cent, with Johor having the highest number of Chinese smallholders. Meanwhile, Indian smallholders were mainly found in Perak.

In terms of monthly income, the survey data indicated that oil palm smallholders were earning much higher than the rubber smallholders. About 31.5 per cent of rubber smallholders lived below the poverty income level as compared to 16.1 per cent among the oil palm smallholders. At the other end, only 2.5 per cent of rubber smallholders were earning an income level of more than RM2,000 per month compared to 6.9 per cent among oil palm smallholders. The percentage of rubber smallholders in the income groups RM256-RM510, RM511-RM1,200, and RM1,201-RM2,000 were 37 per cent, 25 per cent and 4.2 per cent respectively.

The average age of household heads was 58 years and that of the family members was 36.6 years. Overall, 31.0 per cent of smallholders were 66 years old and above, 25.8 per cent were 56-65 years, 22.2 per cent were 46-55 years, 11.0 per cent were 36-45 years and 10.0 per cent were 35 years and below.

Meanwhile, the Agriculture Census 2005 identified 84,900 persons as rubber operators. It represented 54.8 per cent of the total industrial crops operators in the country. Figure 12 shows the distribution of rubber operators by state with Kedah recording the highest number of operators, 19.8 per cent. This was followed by Kelantan (18.3 per cent), Sarawak (14.6 per cent), Sabah (12.7 per cent) and Perak (9.9 per cent). The remaining 24.7 per cent was found in the other states.

Figure 12: Number of rubber operators by state



Source: Agriculture Census 2005 – Crops, Department of Statistics, Malaysia

In terms of educational attainment, the majority of rubber operators obtained formal education (68.2 per cent) where 48.5 per cent were educated up to the primary level and 18.5 per cent until the secondary level. On the other hand, 31.8 per cent had no education (Chart 4). In terms of ethnicity, 61.5 per cent of the rubber operators were Malays, 29.0 per cent Other Bumiputera, 6.9 per cent Chinese, 2.0 per cent Others and 0.6 per cent Indians (Chart 5).

Chart 4: Percentage distribution of rubber operators by level of education

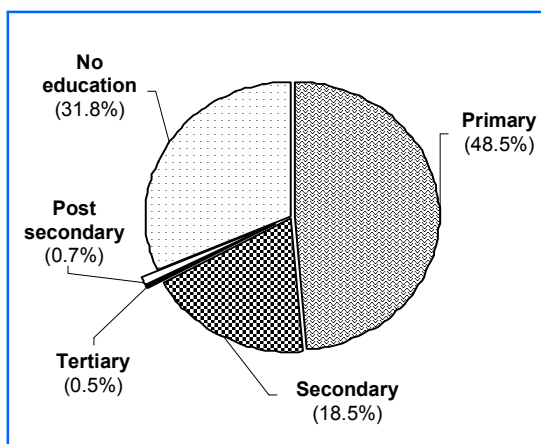
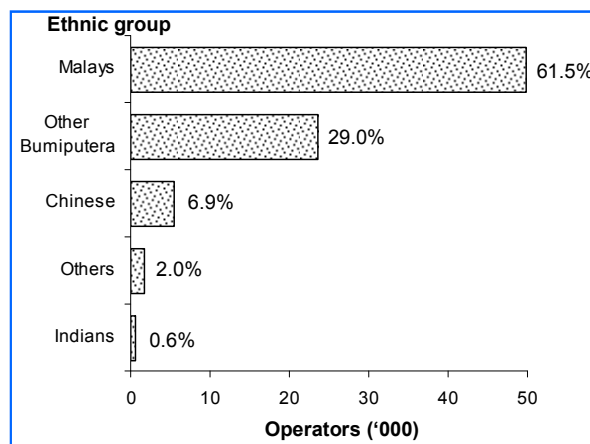


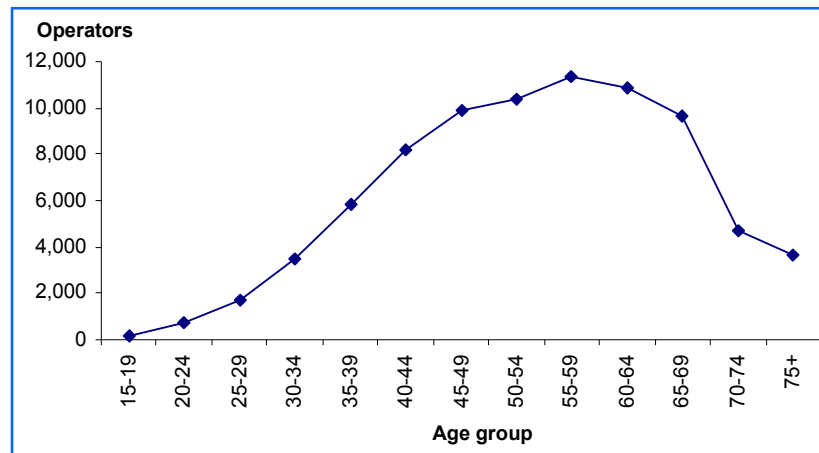
Chart 5: Number of rubber operators by ethnic group



Source: Unpublished data from Agriculture Census 2005 – Crops, Department of Statistics, Malaysia

The Census also showed that 45.3 per cent of rubber operators were aged 55 and above while only 3.2 per cent were aged 29 and below, indicating that generally, young people were not interested in this activity. The average age of the operators was 53 years. The Census results also showed that 10.4 per cent of rubber operators were aged 70 and above and were still active in this activity (Figure 13).

Figure 13: Number of rubber operators by age group



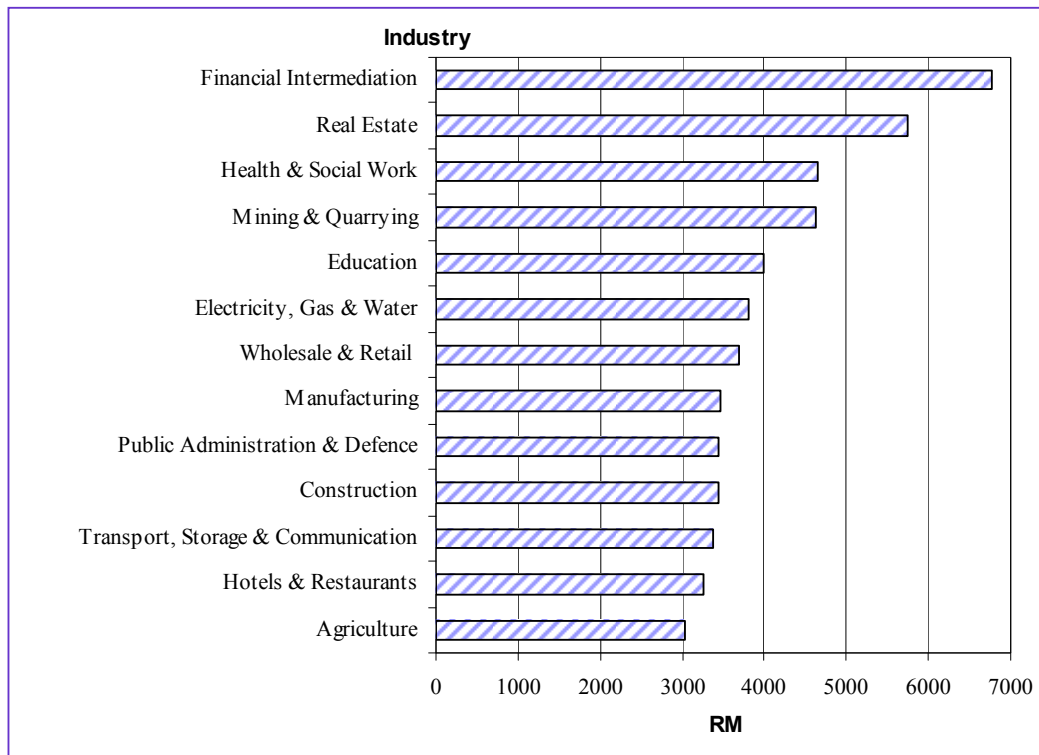
Source: Unpublished data from Agriculture Census 2005 – Crops, Department of Statistics, Malaysia

The results suggested that smallholders covered in RISDA Census 2002 and Agriculture Census 2005 shared a common pattern, that is most of them were aging, had lower levels of education and dominated by Malays. These provided some indications on the socioeconomic profile of rubber smallholders in Peninsular Malaysia.

e. Income and poverty

Agriculture, a major source of employment in the rural areas, is often associated with poverty. More specifically, in terms of mean gross household income, available data from the Household Income Survey 2004 (HIS 2004), indicated that those engaged in agriculture earned the lowest income compared to other sectors (Figure 14). By occupation, skilled agriculture and fishery workers received the lowest mean gross household income of RM1,466 (Table 11). Among occupations in the agriculture sector, the mean gross household income of rubber smallholders was the third lowest (Table 12).

Figure 14: Mean gross household income by industry, 2004



Source: Unpublished data from Department of Statistics, Malaysia

Table 11: Mean gross household income by occupation, 2004

Occupation	Mean Gross Income (RM)
Senior Officials & Managers	7,904
Professionals	6,245
Technicians & Associate Professionals	3,952
Clerical Workers	3,239
Service, Shop and Market Sales Workers	2,706
Skilled Agriculture and Fishery Workers	1,466
Craft and Related Trades Workers	2,480
Plant & Machine-Operators & Assemblers	2,456
Elementary Occupations	2,130

Table 12: Mean gross household income by occupation in agriculture sector, 2004

Occupation	Mean Gross Income (RM)
Padi Farmers	1,222
Rubber Smallholders	1,287
Coconut Smallholders	1,257
Fishermen	1,377
Estate Workers	1,329
Fruit Plantation Workers	1,697
Oil Palm Workers	1,736
Rubber Tappers	1,342

Source: Unpublished data from Department of Statistics, Malaysia

Based on the poverty line income (PLI)⁵ and the results of HIS 2004, it was observed that of the total households of 5.4 million in the country, 5.7 per cent reportedly live below the poverty level (Table 13).

Table 13: Incidence of poverty and hardcore poverty

		1999			2004		
		Malaysia	Urban	Rural	Malaysia	Urban	Rural
Hardcore poverty							
Incidence of hardcore poverty ¹	(%)	1.9	0.5	3.6	1.2	0.4	2.9
Number of hardcore poor households	('000)	91.7	11.9	79.8	67.3	14.1	53.2
Poverty gap ²	(%)	0.4	0.1	0.8	0.3	0.1	0.6
Overall poverty							
Incidence of poverty ³	(%)	8.5	3.3	14.8	5.7	2.5	11.9
Number of poor households	('000)	409.3	86.1	323.2	311.3	91.6	219.7
Poverty gap	(%)	2.3	0.8	4.0	1.4	0.6	3
Total households	('000)	4,800.0	2,612.5	2,187.5	5,459.4	3,605.9	1,853.5

Source: Household Income Surveys, 1999 and 2004

- Notes:
1. Refers to households with monthly gross income of less than the food PLI
 2. Refers to total income shortfall (expressed in proportion to the poverty line) of poor households
 3. Refers to households with monthly gross income below PLI

The highest incidence of poverty occurs in the agriculture sector (Chart 6), particularly among agricultural workers. These workers consistently display the highest incidence and most acute forms of poverty, due mainly to seasonal unemployment and low pay. With incidence of poverty of 37.8 per cent, rubber tappers and rubber smallholders respectively recorded the second and third highest incidence of poverty among agricultural occupational groups (Chart 7).

Chart 6: Incidence of poverty by industry, 2004

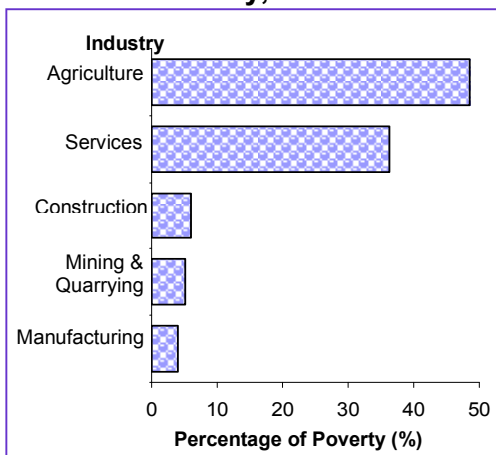
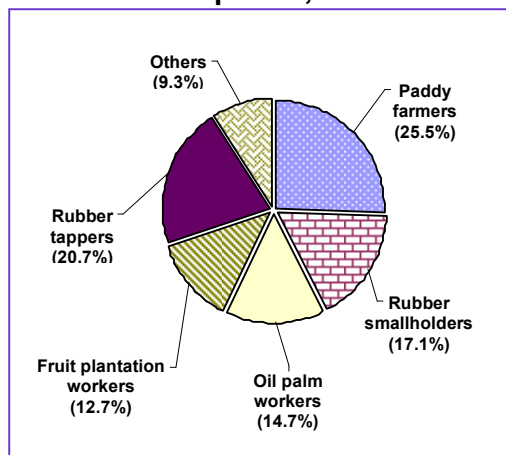


Chart 7: Incidence of poverty by occupation, 2004



Source: Unpublished data from Department of Statistics, Malaysia and Economic Planning Unit (EPU)

In poverty analysis, especially in planning for alternative poverty reduction strategies, it is useful to consider how long it would take for the average poor person to exit from poverty based on different economic growth scenarios⁶. For the j^{th} person below the poverty line, the expected time to exit poverty, i.e. to reach the poverty line Z , if income (or expenditure) y grows at a positive rate g per cent, is given by the following expression :

$$Z = y_j (1 + g)^{t_g^j}$$

The equation can be solved by taking logarithms, yielding the number of periods of growth required before exit as follows:

$$t_g^j \approx \frac{\ln(z) - \ln(y_j)}{g}.$$

The “time to exit” for non-poor will be $t_g^j = 0$.

Figure 14: Time to exit poverty for agriculture industry

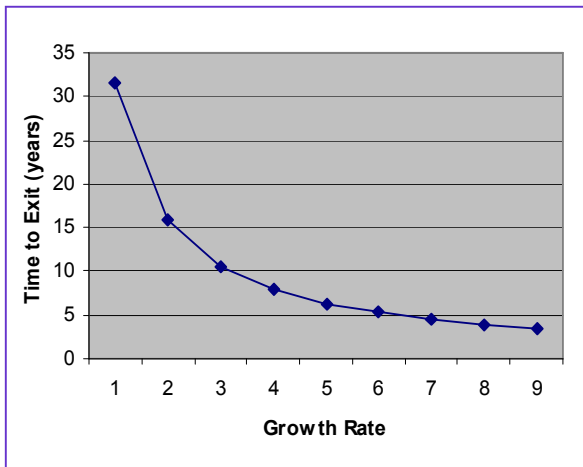
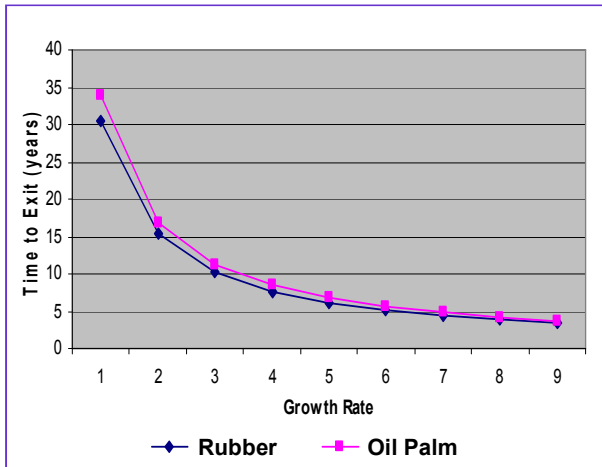


Figure 15: Time to exit poverty for rubber tappers and palm oil workers



Source: Unpublished data from Department of Statistics, Malaysia

In Malaysia, for a continuous growth rate of real income per capita of 1 per cent per year, on average, the time to exit poverty among rubber workers and rubber tappers and oil palm workers would be 30.6 years and 33.9 years respectively. When the growth rate reached 4 per cent in tandem with the growth rate of the income for rural households, the time taken to exit poverty for rubber workers would be 7.7 years. The average time to exit poverty for rubber workers is almost the same as the time to exit poverty for the agriculture industry (Figure 14 and Figure 15).

We have to note that it will take more than just growth to rapidly improve the lives of the very poor. Furthermore, it is unrealistic to assume a continuous uniform growth rate since growth is often skewed towards the higher income brackets and is rarely

continuous. However, the simulation does provide an indication as to the extent of work that needs to be done to eradicate poverty among these workers.

Conclusion

The Malaysian NR industry is very much a smallholder industry with the supply of the commodity coming mainly from the small farmers. However, much dependence on the smallholder sector alone could impede the growth of the industry.

A serious limitation is the generally non-contiguous holdings of uneconomic size (2 hectares and below) which contributes to the wide efficiency gap between the smallholder and the estate sector, and gives rise to the relatively high incidence of poverty among the smallholders.

The traditional or individual rubber smallholders still remain a major poverty group with 31.5 per cent of them living below the poverty line (RISDA Census, 2002) and with more than 90.9 per cent of Malay rubber smallholders earning incomes below RM256 per month (Utusan Malaysia, November 25, 2004). Although based on rather simplistic assumptions, the simulation exercise presented in this paper has indicated that slowing the growth of the industry, and hence the income growth of the smallholders, could seriously prolong their time to exit poverty.

Admittedly, there are other factors which impinge upon the ability to be an efficient and competitive producer of rubber. These include low rate of technology adoption, lack of new investments, and educational/leadership/organisational/entrepreneurial weaknesses as well as aging labour force and labour shortages.

However, initiatives and ongoing efforts in addressing each of these issues should take cognisance of the bigger picture, particularly in relation to increasing competition from other producing countries and the potential threat of synthetic rubber. Thus, diversification into high-tech or high value-added products for engineering, marine, automotive, aeronautical and military use should be directed towards increasing market share of latex-based products. Rubber too, is facing competition in gaining an appropriate share of labour supply, land area and other scarce resources and investment.

The above factors are however inter-related. The relatively bleak outlook of the rubber industry in the country and the general lack of attractive employment opportunities in the rural areas have resulted in the rural-urban drifts of youths in search of a better life elsewhere, the increasing dependence on foreign workers and high incidence of abandoned holdings. The tremendous expansion of the construction and other non-agricultural sectors have attracted workers from both the estates and smallholdings⁷.

In response to the limited availability of labour, rubber estates may partially switch to other crops such as oil palm. On the smallholder side, there is a tendency to abandon old rubber land, thus leading to a decline in tapped areas and hence total rubber production.

In the long run, diversion of investment, labour and resources from rubber may reduce replanting with rubber. Crop migration from rubber to oil palm on a massive scale on the ground of better returns to investments should be a serious concern for those involved in the rubber industry.

To mitigate the problem, the estates may resort to hiring foreign workers while the smallholdings are left with an aging workforce and others who are less likely to move for more attractive employment elsewhere.

Recent highs in the NR price have provided a short term incentive to produce more as smallholders sought to benefit from the price hikes. However, price volatility has inspired farmers to intensify tapping while maintaining existing planting and replanting levels rather than risk venturing into greater planting commitments.

Several policies, strategies and plans have been formulated and implemented by the government to stimulate the growth and sustainability of the Malaysian rubber industry. Considering that the smallholder sector is the mainstay of the country's NR industry in terms of land area, production and rural employment, specific programs were designed to serve the needs of the smallholders. The Malaysian Rubber Board (MRB) had launched a group farming model, *Projek Kampung Getah*, to maximise production and income through integrated farming and improved farming methods and technologies such as adoption of LITS (Low Intensity Tapping System). Besides that, guidance was given to the smallholders on how to manage the land in a small group so that they can work independently without any help from the government. The government also encourages smallholders to use latex-booster, for example Mortex to enhance rubber tree productivity. This is also in addition to good agriculture practices, that the government has emphasised upon over the years⁸.

During the National Agriculture Convention 2007 (Utusan Malaysia, October 28, 2007), the Prime Minister had urged the farmers to form an agro-based co-operative to guarantee their future and to diversify the production of agriculture products. Through the agro-based co-operative, common needs of the smallholders could be better addressed. Joint initiatives and unity of purpose are particularly critical at this juncture when both public and business interests on rubber are waning.

Endnotes

1. See Bank Negara Malaysia, 2007, Annual Report 2006, pp.5.
2. See Department of Statistics, 2007, Labour Force Survey (Profile of Non-Citizens).
3. Based on a paper, Steps Taken to Increase Skilled Labour Force in Plantation Industries & Commodities in Human Capital Development in Plantation & Commodities Sector Committee Meeting (JAMI).
4. See RISDA, 2002, Census of Rubber & Oil Palm Smallholders 2002, pp.xii.
5. The incidence of poverty is based on the poverty line income (PLI). The PLI is defined as an income sufficient to purchase a minimum basket of food and other basic needs to maintain household members in good nutritional health. The PLI is updated annually on the basis of the Consumer Price Index.
6. Adopting the theoretical framework proposed by Morduch (1998) and Albert (2005) who conducted a simulation for the Philippines based on several growth assumptions and noted the importance of a measure of 'time to exit poverty' in formulating an appropriate poverty reduction strategy for the country.
7. Smit (1982), pp. 251-257 attributed the shortage to the lure of better quality of labour conditions as well as the *bright lights of industrial and town life*. The switch from rubber to industry is said to be irreversible, resulting in long term consequences.
8. See Parliamentary debates in House of Representatives dated 2nd May 2006. (www.parlimen.gov.my/handsard.php)

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